WHAT IS CLAIMED IS:

1. A method for forming a stacked barrier layer on a substrate disposed in a processing chamber, said method comprising:

serially exposing said substrate to first and second reactive gases to form an adhesion layer; and

serially exposing said adhesion layer to third and fourth reactive gases to form a barrier layer adjacent to said adhesion layer.

2. The method as recited in claim 1 further including depositing a layer of copper adjacent to said barrier layer.

3. The method as recited in claim 1 further including repeating serially exposing said substrate to first and second reactive gases to form said adhesion layer to a desired thickness before serially exposing said adhesion layer to third and fourth reactive gases.

4. The method as recited in claim 3 further including repeating serially exposing said substrate to third and fourth reactive gases to form said barrier layer to a desired thickness after serially exposing said substrate to first and second reactive gases.

5. The method as recited in claim 1 further including providing first and second processing chambers wherein serially exposing said substrate to first and second reactive gases further includes serially exposing said substrate to said first and second reactive gases while said substrate is disposed in said first processing chamber and serially exposing said adhesion layer to third and fourth reactive gases further includes serially exposing said adhesion layer to third and fourth reactive gases while said substrate is positioned in said second processing chamber.

6. The method as recited in claim 3 further including providing first and second processing chambers wherein serially exposing said substrate to first and second reactive gases further includes serially exposing said substrate to said first and second reactive gases while said substrate is disposed in said first processing chamber and serially exposing said adhesion layer to third and fourth reactive gases further includes serially exposing said adhesion layer to third and fourth reactive gases while said substrate is positioned in said first processing chamber and depositing a layer of copper adjacent to said barrier layer further includes depositing a copper layer adjacent to said barrier layer when said substrate is positioned in said second processing chamber.

7. The method as recited in claim 3 further including providing first, second and third processing chambers wherein serially exposing said substrate to first and second reactive gases further includes serially exposing said substrate to said first and second reactive gases while said substrate is disposed in said first processing chamber and serially exposing said adhesion layer to third and fourth reactive gases further includes serially exposing said adhesion layer to third and fourth reactive gases while said substrate is positioned in said first processing chamber and depositing a layer of copper adjacent to said barrier layer further includes depositing a copper layer adjacent to said barrier layer when said substrate is positioned in said third processing chamber.

8. The method as recited in claim 1 wherein serially exposing said substrate further includes introducing said second reactive gas into said processing chamber and further including purging said processing chamber of said second reactive gas before exposing said adhesion layer to said third reactive gas.

9. The method as recited in claim 1 wherein said first and third gases each includes a refractory metal compound, with the refractory metal compound associated with said first reactive gas differing from the refractory metal compound associated with said third reactive gas.

10. The method as recited in claim 1 wherein said first reactive gas is selected from the group consisting essentially of TDMAT, TDEAT and $TiCl_4$ and said second reactive gas is selected from the group consisting essentially of H_2, B_2H_6, SiH_4 and NH_3.

11. The method as recited in claim 1 wherein said third reactive gas is WF_6 and said fourth reactive gas is selected from the group consisting essentially of SiH_4, B_2H_6 and NH_3.

12. The method as recited in claim 1 wherein serially exposing said substrate further includes serially introducing said first reactive gas and said second reactive gas into said processing chamber, and purging said processing chamber of said first reactive gas before introducing said second reactive gas by introducing a purge gas into said processing chamber after exposing said substrate to said first reactive gas and before exposing said substrate to said second reactive gas.

13. The method as recited in claim 1 wherein serially exposing said substrate further includes serially introducing said first reactive gas and said second reactive gas into said processing chamber, and purging said processing chamber of said first reactive gas before introducing said second reactive gas by pumping said processing chamber clear of said first reactive gas before introducing said second reactive gas.

14. The method as recited in claim 1 wherein serially exposing said adhesion layer further includes serially introducing said third and fourth reactive gases into said processing chamber, and purging said processing chamber of said third reactive gas before introducing said fourth reactive gas by introducing a purge gas into said processing chamber after exposing said substrate to said third reactive gas and before exposing said substrate to said fourth reactive gas.

15. The method as recited in claim 1 wherein serially exposing said adhesion layer further includes serially introducing said third and fourth reactive gases into said processing chamber, and purging said processing chamber of said third reactive gas before introducing said fourth reactive gas by pumping said processing chamber clear of said third reactive gas before introducing said fourth reactive gas.

16. A method for forming a stacked barrier layer on a substrate disposed in a processing chamber, said method comprising:

serially exposing said substrate to first and second reactive gases to form an adhesion layer, by introducing said first reactive gas into said processing chamber and removing said first reactive gas from said processing chamber before introducing said second reactive gas;

repeating serially exposing said substrate to first and second reactive gases to form said adhesion layer to a desired thickness;

serially exposing said adhesion layer to third and fourth reactive gases to form a barrier layer adjacent to said adhesion layer by introducing said third reactive gas into said processing chamber and clearing said third reactive gas from said processing chamber before introducing said fourth reactive gas;

repeating serially exposing said substrate to third and fourth reactive gases to form said barrier layer to an acceptable thickness;

purging said processing chamber of said first and second reactive gases before introducing either of said third and fourth reactive gases; and

depositing a layer of copper adjacent to said barrier layer.

17. The method as recited in claim 16 wherein said first reactive gas being selected from the group consisting essentially of TDMAT, TDEAT and $TiCl_4$, said second reactive gas being selected from the group consisting essentially of H_2, B_2H_6, SiH_4 and NH_3, said third reactive gas being WF_6, and said fourth reactive gas being selected from the group consisting essentially of SiH_4, B_2H_6 and NH_3.

18. The method as recited in claim 16 wherein serially exposing said substrate to first and second reactive gases further includes removing said first reactive gas from said processing chamber before introducing said second reactive gas by introducing an inert gas into said processing chamber, and serially exposing said adhesion layer to third and fourth reactive gases further includes clearing said third reactive gas from said processing chamber before introducing said fourth reactive gas by introducing an expulsion gas into said processing chamber, and purging said processing chamber of said first and second reactive gases further includes purging said processing chamber by introducing a purge gas into said processing chamber.

19. The method as recited in claim 16 wherein serially exposing said substrate to first and second reactive gases further includes removing said first reactive gas from said processing chamber before introducing said second reactive gas by pumping said processing chamber clear of said first reactive gas, and serially exposing said adhesion layer to third and fourth reactive gases further includes clearing said third reactive gas from said processing chamber by pumping said processing chamber clear of said third reactive gas, and purging said processing chamber of said first and second reactive gases further includes pumping said processing chamber clear of all gases present therein.

20. A processing system for forming a stacked barrier layer on a substrate in a processing chamber, said system comprising:

means, coupled to said processing chamber, for serially exposing said substrate to first and second reactive gases to form an adhesion layer, by introducing said first reactive gas into said processing chamber and removing said first reactive gas from said processing chamber before introducing said second reactive gas;

means, coupled to said processing chamber, for repeating serially exposing said substrate to first and second reactive gases to form said adhesion layer to a desired thickness;

means, coupled to said processing chamber, for serially exposing said adhesion layer to third and fourth reactive gases to form a barrier layer adjacent to said adhesion layer by introducing said third reactive gas into said processing chamber and clearing said third reactive gas from said processing chamber before introducing said fourth reactive gas;

means, coupled to said processing chamber, for repeating serially exposing said substrate to third and fourth reactive gases to form said adhesion layer to a desired thickness before serially exposing said adhesion layer to third and fourth reactive gases;

means, coupled to said processing chamber, for purging said processing chamber of said first and second reactive gases before introducing either of said third and fourth reactive gases; and

means, coupled to said processing chamber, for depositing a layer of copper adjacent to said barrier layer.

21. A processing system for forming a stacked barrier layer on a substrate, said system comprising:

a body defining a processing chamber;

a holder disposed within said processing chamber to support said substrate;

a gas delivery system in fluid communication with said processing chamber;

a first temperature control system in thermal communication with said processing chamber;

a pressure control system in fluid communication with said processing chamber;

a controller in electrical communication with said gas delivery system, said temperature control system, and said pressure control system; and

a memory in data communication with said controller, said memory comprising a computer-readable medium having a computer-readable program embodied therein, said computer-readable program including a first set of instructions for controlling said gas delivery system to serially exposing said substrate to first and second reactive gases to form an adhesion layer on said substrate, and a second set of instructions to control said gas delivery system to serially expose said adhesion layer to third and fourth reactive gases to form a barrier layer adjacent to said adhesion layer.

22. The system as recited in claim 21 wherein said computer-readable program includes a third set of instructions to control said gas delivery system to remove said first reactive gas from said processing chamber before introducing said second reactive gas by introducing an inert gas into said processing chamber, and a fourth set of instructions to control said gas delivery system to clear said third reactive gas from said processing chamber before introducing said fourth reactive gas by introducing an expulsion gas into said processing chamber, and a fifth set of instructions to control said gas delivery system to purge said processing chamber of said first and second reactive gases before introducing said third and fourth reactive gases by introducing a purge gas into said processing chamber.

23. The system as recited in claim 21 wherein said computer-readable program includes a third set of instructions to control said pressure control system to remove said first reactive gas from said processing chamber before introducing said second reactive gas by pumping said processing chamber clear of said first reactive gas, a fourth set of instructions to control said pressure control system to and clear said third reactive gas from said processing chamber before introducing said fourth reactive gas by pumping said processing chamber clear of said third reactive gas, and a fifth set of instructions to control said pressure control system to purge said processing chamber of said first and second reactive gases before introducing said third and fourth reactive gases by pumping said processing chamber clear of said first and second reactive gases.

24. The system as recited in claim 23 wherein serially exposing said substrate includes serially exposing said substrate to first and second reactive gases to form a titanium-containing adhesion layer, and serially exposing said adhesion layer to third and fourth reactive gases to form a tungsten-containing barrier layer adjacent to said titanium-containing adhesion layer.

25. The system as recited in claim 23 wherein said first reactive gas is selected from the group consisting essentially of TDMAT, TDEAT and $TiCl_4$, said second reactive gas is selected from the group consisting essentially of H_2, B_2H_6 and SiH_4, said third reactive gas is WF_6, and said fourth reactive gas is selected from the group consisting essentially of SiH_4, B_2H_6 and NH_3.